DOCUMENT RESUME

ED 313 340 SP 031 674

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TITLE Developing a Procedural Model for the Practice of Micro Teaching.
PUB DATE 23 Aug 89
NOTE 29p.
PUB TYPE Reports - Descriptive (141)

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Higher Education; *Microteaching; Preservice Teacher Education; Program Content; *Program Design; *Research Utilization; *Teaching Methods; *Teaching Models

ABSTRACT

This report describes the use of a specific model for designing educational practices in formulating a structure of knowledge which applies to micro teaching. The design of an educational practice, that is, the use of micro teaching, requires a synthesis of related studies organized into a format for designing and conducting the practice by drawing on related studies. The first step in this "goal-procedural" model is to develop a procedural model as an organizational structure for the practice. The synthesis and structure of knowledge obtained through this model serves as the basis on which to develop a design to use the practice in a given setting. The second step is to form the design of a new practice or analyze and modify a current practice. In discussing this model, the following categories are used to provide a structure for describing or designing micro teaching: (1) purposes/goals for micro teaching; (2) rationale for the micro teaching strategy; and (3) operational elements for conducting micro teaching. These operational elements include: (1) curricular content; (2) student participants; (3) facilities and setting; (4) skill study; (5) subject matter to teach; (6) planning lessons; and (7) feedback. A list of 73 references is appended. (JD)

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DEVELOPING A PROCEDURAL MODEL

FOR THE PRACTICE OF MICRO TEACHING

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DEVELOPING A PROCEDURAL MODEL FOR THE PRACTICE OF MICRO TEACHING

The use of micro teaching as an instructional strategy in preservice and inservice teacher education is wide-spread and used in a variety of ways (Gregory, 1986; Jones, 1979; Ward, 1970). Extensive research has been conducted to identify the best techniques to use with micro teaching, but little attempt has been made to actually synthesize the research and program description data into a form most useful for designing or modifying the practice. Criticism of the evolution of micro teaching has centered on the lack of incorporating research findings into practice and further conceptualization of the practice (Gregory, 1986).

This report describes the use of a specific model for designing educational practices in formulating a structure of knowledge which applies to micro teaching (Hatfield et al., 1989) According to this model the design of an educational practice, e.g. the use of micro teaching, requires a synthesis of related studies organized into a format for designing and conducting the practice by drawing on related studies (see Figure 1).

-Insert Figure 1-

The first step in this "Goal-Procedural" model is to develop a procedural model as an organizational structure for the practice. The synthesis and structure of knowledge obtained through this model serves as the basis on which to develop a design to use the practice in a given setting. The second step is to form the design of a new practice or analyze and modify a

current practice. If the practice is currently being used the procedural model serves as a guide to describe the practice, relate conclusions from research studies to the practice, and if needed to modify the practice. Using this model the following categories have been formulated to serve as a procedural model and represent the structure for describing or designing micro teaching and for organizing the remainder of this report (see Figure 2).

A. Purposes/Goals for Micro Teaching

B. Rationale for the Micro Teaching Strategy

C. Operational Elements for Conducting Micro Teaching

-Insert Figure 2-

Purposes/Goals for Micro Teaching

Micro teaching was first developed as a strategy to replace student teaching in a graduate teacher preparation program. The definition of micro teaching given by the developers, Allen and Cooper (1970), states that,

> Micro teaching is a teaching situation which is scaled down in terms of time and numbers of students -usually a 4 to 20-minute lesson- involving 3 to 10 students. By scaling down the lesson, some of the complexities of the teaching act are reduced, allowing the teacher to focus on selected aspects of teaching. Frequently, a micro teaching episode includes teaching a lesson and receiving feedback on the teacher's effectiveness. The feedback may come from videotape or audiotape recordings, supervisors, pupils, colleagues, and/or from the teacher's self-perceptions. (p. 1)

Two major purposes for using a micro teaching strategy are implied in various studies and program descriptions, (a) to provide an experiential setting in which to learn and practice teaching skills, and (b) to provide a teaching experience in

which direct feedback can be given on a teacher's performance.

One of the major difficulties in teacher preparation programs has been an insufficient opportunity for students to be directly involved in teaching. Lectures and discussion techniques have been commonplace in most methods courses. But a more direct teaching experience can be provided using the micro teaching model.

The major focus in micro teaching situations has been to teach K-12 students (Johnson & Pancrazio, 1971; Ward et al., 1972; Yeany, 1975). The results from these programs have been fairly positive (Gregory, 1986; Jones, 1979) but inconsistent. The simplist and least involved micro teaching model is to teach a group of peers from the same class. Success in the use of peers as students is mixed but has been useful in some cases (Clifford et al., 1977; Johnson & Pancrazio, 1971; Peterson, 1977).

A key element in judging the benefits from micro teaching experiences is the time required. Positive results have usually been achieved in developing teaching skills through micro teaching in comparison to the time required to achieve results using other strategies (Kallenbach & Gall, 1969).

Providing direct feedback on teaching performance is another primary focus in most micro teaching settings. The form of feedback has usually been from supervisors, peers, pupils or self, and by using video or audio tape recordings. The use of supervisors in these sessions is time consuming and, therefore, expensive. Consequently, considerable attention has been given to

alternative forms of feedback. Yet, the use of supervisors is frequently practiced with positive results (Guelcher, 1970; Kise, 1973). Pupil feedback forms and tests, peers and self-reflection represent alternative approaches tried with mixed success. Yet, these alternatives all appear to be useful under certain conditions (Edwards, 1975; Guelcher, 1970; Impey, 1983; Koran & Koran, 1973).

The use of audio versus video taping is an issue partially tied to cost and availability of equipment. Both forms of feedback have proven successful although there has been varying degrees of correlation depending on the particular skills being practiced (Hiscox & VanMondfrans, 1972; Jones, 1979; Legge & Asper, 1972).

These two purposes, direct teaching experience and direct feedback, have been integral to most micro teaching activities and have provided a significant learning experience for many teacher candidates and inservice teachers (Jones, 1979; MacLeod, 1987; Ward, 1970).

Rationale for Micro Teaching

Micro teaching represents a real, yet controlled, teaching situation which provides a substantial and varied learning experience without creating impossible time demands for the preservice teacher (Allen and Clark, 1967).

A conceptual perspective on the use of micro teaching is provided by Allen and Cooper (1970),

> The teaching skills approach is based on the assumption that, by breaking down the complex teaching act into more easily learned skills, the teacher can gradually acquire

> a repertoire of teaching skills to use in the actual classroom. By building a repertoire of skills the teacher is increasing his flexibility and versatility. He has more techniques at his command in order to vary his questions, reinforcement, or presentation styles. Thus, he is able to adapt his teaching style to suit the students' needs or the objective of the lesson. (p. 3)

These behaviors are, on the basis of research data, beneficial to quality teaching and, therefore, enhancing their use should be advantageous to a person's teaching performance.

For more complex teaching skills Allen and Cooper (1970) suggested the following modifications in the basic procedure: (a) use a 20-25 minute lesson followed by a 30-40 minute critique, (b) team teach a unit to 3 to 4 persons over a period of 3-4 weeks, and (c) focus the critique on appropriateness of objectives and techniques, organization and student involvement.

The mini-course, frequently related to micro teaching as a means for skill development, is defined by Allen and Cooper (1970) as a product containing instructional films, handbooks, and evaluation forms, and the process of micro teaching. This process is generally carried out without the use of a supervisor.

Additional support for micro teaching is based on its potential to provide teacher candidates less complex settings in which to practice skill development and at the same time economize on the time and resources needed to learn the skills. Meier (1968) identifies several concepts of learning theory which support various aspects of micro teaching.

1. Motivating learners by creating dissonance in looking at a videotape of one's own teaching.
2. Obtaining successful experiences through positive feedback.

3. Meeting goals by focusing on a single technique.

4. Active participation in learning through teaching.

5. Overlearning of specific skills obtained from repeated practice.

6. Transfer of learning by obtaining knowledge of performance.

In addition Allen and Ryan (1969) report several general conditions of learning provided through micro teaching and minicourse procedures. These conditions are:

1. Micro teaching is really teaching, although the teaching situation is a constructed one in the sense that teacher and students work together in a practice situation, nevertheless, bona-fide teaching does take place.

2. Micro teaching lessens the complexities of normal classroom teaching. Class size, scope of content and time are all reduced.

3. Micro teaching focuses on training for the accomplishment of specific tasks. These tasks may be the practice of instructional skills, the practice of techniques of teaching, the mastery of certain curricular materials, or the demonstration of teaching methods.

4. Micro teaching allows for the increased control of practice. In the practice setting of micro teaching, the rituals of time, students, methods of feedback, supervision, and many other factors can be manipulated. As a result, a high degree of control can be built into the training program.

5. Micro teaching greatly expands the normal knowledge of the results or feedback dimension of teaching. Immediately after teaching a brief micro lesson the trainee engages in a critique of his/her performance. To give maximum insight into this performance, several sources of feedback are available.

6. In a micro teaching setting, good teachers can demonstrate their skills and be recorded on videotape. The basic structure of micro teaching and its built-in flexibility make a natural setting in which to develop instructional methods of various teaching skills and techniques.

> Teaching skills can be isolated and their performance highlighted so that the viewer can more easily identify the behaviors that make up the skill.

Critics of micro teaching have argued that the setting is not sufficiently comparable to the classroom for transfer of skill development. Studies on the effects of micro teaching are not consistent but do provide considerable support for its use. In a 3 year follow-up study of teachers who are currently teaching Hargie and Dwyer (1982) report that 91 percent of the teachers who participated in micro teaching rated its benefits to them as useful or very useful. An equal number of teachers also indicated a refresher course on teaching skills via micro teaching would be helpful. Allen & Clark (1967) state that micro teaching adapts easily to a wide range of pupil types and skills, provides an efficient use of time, and simplifies the use of resources.

Kallenbach & Gall (1967) found no difference between the teaching performance of students previously engaged in student teaching experience versus a micro teaching experience. Yet, in this project there was over 100 more hours spent by the student teachers during the same term. Peterson (1973) found that student teachers with prior micro teaching experience showed no major differences in their performance over those without this experience. In a study involving inservice teachers Perrott et al. (1975) found that a mini-course unit resulted in significant improvement in over half of the skills studied following a four-month time interval.

Based on these reports micro teaching can be described as an instructional strategy which is useful for developing selected teaching skills. Incorporating several desirable principles of learning the strategy has been successful in numerous types of settings. Efficient in the use of time and resources and directly effecting changes in teacher behavior micro teaching represents a useful tool in learning to teach. Central to this strategy is the use of a specific focus on learning objectives and the use of feedback on performance.

Operational Elements for Conducting Micro Teaching

Basic to formulating the structure of knowledge for an educational practice is the identification of categories which adequately reflect the actual procedures used for that practice. Categories for micro teaching which have been identified through an analysis of research and descriptions of practice are:

1. Curricular content
2. Student participants
3. Facilities and setting
4. Skill study
5. Subject matter to teach
6. Planning lessons
7. Feedback

A review of the general processes used in micro teaching provides a context for describing these seven categories. Three general approaches have been used in micro teaching, the tightly organized teach-reteach model first developed at Stanford, a looser model usually involving a longer time frame and without a reteach component, and the mini-course format in which micro teaching is but one element.

The general strategy for micro teaching includes a study of particular skills, planning a lesson incorporating these skills, teaching, and obtaining feedback on the teaching. In some instances a replan, reteach session follows immediately. Variations also occur in the use of student participants and in the form of feedback.

Fortune et al. (1967) describe the original organization used in micro teaching as including:

1. One hour of instruction on a skill.
2. Plan and teach a 5 minute lesson (video tape with supervisor observing the lesson).
3. A 10 minute supervisory conference.
4. Replan and reteach a 5 minute lesson to different pupils.
5. A 10 minute supervisory conference.

In the modified or extended version of the organization (Fortune et al., 1967) a team of 2 or more teacher candidates plan and teach a unit over several days time (not necessarily in a daily sequence), with each person teaching a 20 minute lesson followed by a supervisory conference.

Additional variations in the strategy include a strong emphasis given to subject matter and how lessons are planned versus skill training. Guelcher et al. (1970) describe a strategy which includes steps for analyzing the subject matter objectives, the relation of student responses to the content and how the content relates to teaching skills. In this case planning and subject matter are given much greater emphasis.

A different organization for micro teaching was used by

Koran (1974) in a Texas Teacher Corps project. This training model included:

1. Assessment of competencies via micro teaching.
2. Desired teacher behavior specified through live, filmed and written models.
3. Trainee attempts to acquire behavior and practices via micro teaching.
4. Feedback and reinforcement through supervisory and self rating.
5. Additional practice and final assessment via micro teaching.

Most studies and programs for micro teaching provide some level of description about the general process used in carrying out the practice. Although seldom described in great detail there is always a particular set of activities to be followed.

More specific studies identified with each of the operational elements are summarized under each category.

Curricular Content

Specific goals included in micro teaching experiences include the development of various attitudes, skills, planning and general teaching competence.

Copeland (1973) studied the use of higher order and probing questions and found a significantly higher performance in these skills among students having engaged in micro teaching. Koran and Koran (1973), investigating the use of analytic questions, found the quality of their use in teaching was significantly better when practiced through micro teaching. Perrott et al. (1975) investigated 14 different aspects of questioning techniques, i.e.

prompting, clarifying, redirecting questions, and not repeating questions, with significant results on these particular forms of interaction. Peterson (1973), asking how questions are stated and the form of interactions, i.e. pausing, redirecting, and prompting, refocusing, reports that only a few skills learned in micro teaching were carried over to a student teaching experience which followed this practice.

Solomon and McDonald (1970) studied the use of divergent questions, interactive skills, independent learning skills, individualization in math, and decoding skills in reading. Yeany (1975) studied elementary science preservice teachers use of indirect teaching techniques and an inductive strategy.

Micro teaching conducted by Fortune et al. (1967) included development of lecturing techniques, presentation skills, pre-instructional procedures, controlling techniques and procedures, discussion skills, consolidation skills, and eva'uation skills. The teacher education candidates reported these skills to be of importance in their preparation program.

Guelcher (1970) investigated the relation of lesson content to the broader curriculum and lesson objectives to student responses for reinforcement, probing questions, higher order questions, use of silence in pupil responses and non-verbal cues.

Peters (1981) studied the improvement in perception of self as a teacher and one's attitude toward teaching using a semantic differential attitude test about teaching, but found no impact from micro teaching. Working with elementary science preservice teachers, Sparks and McCallen (1974) investigated students'

attitudes about teaching science with a similar result. Legge and Asper (1972) studied the use of self-evaluation skills in conjunction with micro teaching with very positive results.

The goals emphasized during micro teaching range from specific skills for questioning and verbal interactions to relating these skills to content, use of management techniques, and the inductive teaching strategy. Developing positive attitudes about teaching and science have also been included in some programs, but with less success.

Student Participants

Students from a variety of settings, including all grade levels and subject areas, have been used in micro teaching. Generally the participants are classified as peers or K-12 students. College freshman were a third group used in a study by Johnson and Pancrazio (1971) to identify differences in the effectiveness between these three types of students. The three groups taught by secondary social studies majors included high school students, peers, and university freshman. A student teaching experience followed this micro teaching activity with subjects who taught high school students being rated significantly higher on their teaching performance after five weeks.

Using peers as student participants Clifford et al. (1977) obtained feedback on the perceptions of the foreign language teacher candidates about the value of micro teaching. In this instance the activity was cited as the most important of their

pre-student teaching courses. Peters (1981) compared the use of a micro teaching versus a reflective teaching format in a vocational education methods course in which peers served as student participants for both groups. Positive results were obtained from both formats.

Any form of teaching includes both the teacher and learner. Because micro teaching is an artificial teaching situation provision is needed to identity a set of students who can be participants and who can contribute to the development of the teacher. As indicated there are different sources for obtaining participants.

Facilities and Setting

Descriptions of facilities and settings used in micro teaching are very infrequent, but some rather extensive facilities have been described. Fortune et al. (1967) indicate the use of a classroom on the university campus which was specially equipped with video and audio visual equipment. In this program a micro teaching clinic included 8 classrooms (four of which included video equipment), located on the university campus with audio visual equipment, desks and blackboards. Ukovich and Pfeiffer (1979-80) indicate the use of a similar micro teaching lab in their program. Nearly 50% of the higher education institutions using micro teaching may have some form of formal lab setting (Jones, 1979).

Skill Study

A key element in using the micro teaching strategy is providing preliminary information on the skills to be practiced.

Koran (1974) has provided a perspective on this issue indicating that "observational learning...was learning to make a number of responses that characterized a class of behavior and rather than being convergent, was actually divergent in nature" (p. 209). He states further that in the Texas Teacher Corps project,

> models of questioning behavior which elicited observation and classifying responses were designed to give a wide range of examples of the modeled behavior in a number of classes....The observer then acquired a class of responses rather that a discrete behavior of limited utility. (Koran, 1974, p. 209)

Edwards (1975) reports a study in which students taught five micro lessons with information on each teaching skill being developed through (a) reading a description of the skill, (b) viewing a video taped model of the skill and completing a written exercise on the model, and (c) reading general information on the skill.

Fortune et al. (1967) report the study of various skills which includes reading about the skills with examples and role playing. Guelcher et al. (1970) also used these activities in their study together with the analysis of a model lesson. These lessons were analyzed (by a group) for student-teacher interactions and for relating teaching skills to the content. In addition teacher candidates were provided a seminar on techniques of peer supervision.

Koran and Koran (1973) report skill study through the use of protocols versus a written transcript model focusing on the analysis of an article on Thoreau. Both techniques were significantly better than none, but the use of protocols was

superior to the written transcript.

Yeany (1975) investigated three approaches on the use of indirect strategies in elementary school science teaching. Although not followed by micro teaching practice a video tape of the groups demonstrating indirect strategies was made and analyzed. The first approach was to learn strategy analysis as defined by the "Teaching Strategies Observation Differential," and the study of related research. The second approach involved 4 video tapes and one 16mm film presentation on models of the inductive strategy followed by discussion of the subject's questions. A third approach combined the activities from both the others. Some student attitudinal perceptions favored the combination group, but there were no differences in strategies actually used among subjects from the three groups.

Ward et al. (1972) report on the use of mini courses which include model and demonstration films together with printed guidelines for the teaching skills being studied. Jones (1979) reports that some form of modeling protocols are used by most programs with live demonstrations far more common than video tapes. In fact, reading and lecture appear to be the most frequent modes for learning skills.

The preliminary study of skills to be focused on during micro teaching include variations in time, method and emphasis, but does provides a key dimension in the process.

Subject Matter to Teach

Almost any content can be included as the subject matter for

micro teaching. The selection of content is primarily site specific and dependent on the participating students, and/or a school curriculum. There is also a need to match the subject matter with the micro teacher's knowledge such as occurs in teaching science concepts. For example, elementary teacher candidates frequently have a limited background in science and need to develop greater subject knowledge if they teach in this area.

Information on the actual subject matter from the various disciplines is largely undocumented and, unfortunately, so is the nature of the knowledge taught i.e., concepts, values, procedures. Although not generally explicated in reports of research or program descriptions all micro teaching sessions include some subject matter. The study by Guelcher et al. (1970) sets the stage for this element identifying subject matter as a central issue in micro teaching.

Planning Lessons

Micro teaching obviously requires a lesson to teach, but again very little documentation in research studies or program descriptions indicate the nature or form of this planning. In two instances specific mention of planning referred to a class on lesson planning in conjunction with micro teaching (Kallenbach and Gall, 1969), and planning lessons in conjunction with a lab school supervisor (Legge and Asper, 1972). Two studies report a time frame for planning lessons; Solomon and McDonald (1970) provided a 24 hour time period, and Wagner (1973) a 15 minute time frame to prepare a 5 minute lesson. In the latter

case the lesson was to be on the topic being studied which was discrimination skills.

As with the subject matter category, few descriptions on lesson planning have been provided, yet in all micro teaching situations planning is a necessary ingredient. As indicated here there are options for designing practice, at least in how to prepare plans and the time frame allowed to prepare.

Feedback

Techniques for giving feedback to teacher candidates are central to micro teaching and are amply described in research studies. Edwards (1975) studied the use of peer feedback in contrast to that by regular faculty and found no difference in the subjects' performance. Hargie and Dwyer (1982), however, used a video tape replay session, one with peers and one with supervisors, with subjects perceiving the supervisors as being the more useful technique. A related report by Kise (1973) identifies a significant difference in supervisory critiques with specific comments being more effective than general comments. Ukovich and Pfeiffer (1979-80) explored supervisor versus self-feedback and report that for high self-concept subjects viewing one's video playback and completing a self-evaluation report are effective. Low self-concept subjects require a supervisor's direct input in their feedback.

Student participants are also frequently involved in providing feedback to the teacher. To enhance the effectiveness of this activity Allen (1967) reports the use of a six hour

training session for high school student participants in using the Stanford Teacher Competency Appraisal Guide. In the same program Fortune et al. (1967) indicate that the high school students were paid for participating in each micro teaching session.

Audio, video and rating forms all represent vehicles through which to give feedback. Hiscox and VanMondfrans (1972) contrasted the audio and video forms, both used in conjunction with self-evaluation and student reporting, with about the same results. Audio feedback was best when the practicing student initiated questions. Legge and Asper (1972) used video tape replays in conjunction with highly structured self-evaluation forms resulting in significant effects in contrast to not using self-evaluation techniques. Jones (1979) indicates the wide-spread use of video recorders for observing the teaching lesson.

The various techniques used in giving feedback on teaching performance are obviously central to micro teaching practice but provide many options for the use of various techniques and personnel.

Summary of the Procedural Model for Micro Teaching

The procedural elements of micro teaching described here provide considerable support for its use as a framework for designing, and describing or modifying specific teaching skills. Accordingly the studies reviewed provide for various approaches and goals by which micro teaching can be designed. The designer needs to review the possible purposes, rationale and operational elements, and design the procedure to meet the contextual

conditions present in their specific institutional setting.

The Goal-Procedural model for educational design on which this report is based provides a format for designing micro teaching practice for use in many different contexts. Each design may differ in some way but each of the procedural elements needs to be included. When a design is implemented it still needs to be documented to determine the comprehensiveness of the implementation and the results of its use. Continuous documentation of results and monitoring ongoing research studies will provide information for further modification in the practice. Modification of an ongoing program or the analysis of a newly designed program requires the practitioner to relate the underlying assumptions of the practice to research studies and change those aspects of the practice which are negated by conclusions from the research.

References

Acheson, K. and Tucker, P. (1971). Video tape versus written instruction and video tape audio tape feedback in a minicourse on higher cognitive questioning. Berkeley,CA: Far West Laboratory for Educational Research and Development.

Allen, D. (1966). A new design for teacher education: The teacher intern program at Stanford University. Journal of Teacher Education, 17(3), 296-300.

Allen, D. (1967). Micro teaching: A description. ERIC, ED 019 224.

Allen, D. and Cooper, J. (1970). Micro teaching. ERIC, ED 041 190.

Allen, D. and Clark, R. (1967). Microteaching: Its rationale. High School Journal, 51(2), 75-79.

Allen, D. and Ryan, K. (1969). Microteaching. Reading, MA: Addison Wesley.

Applebee, A. (1976). Microteaching, component skills and the training of teachers: An evaluation of a research and development project. British Journal of Educational Technology, 7(2), 35-44.

Borg. W. R. (1971). The minicourse--A milestone on the road to better teaching. British Journal of Educational Technology, 2(1), 14-23.

Borg, W. R. (1972). The minicourse as a vehicle for changing teacher behavior: A three-year follow-up study. Journal of Educational Psychology, 6, 572-579.

Borg, W. R. et al. (1969). Video tape feedback and microteaching in a teacher training model. Journal of Experimental Education, 37(4), 9-16.

Boulanger, F. D. (1978). Teacher training in science: The effects of three feedback modes on learning a science principle. Science Education, 62(2), 195-202.

Brown, W. (1977). The effect of process-skill instruction on performance of preservice elementary teachers. Journal of Research in Science Teaching, 14(1), 83-87.

Campbell, R. L. and Okey, J. R. (1977). The planning of teachers with instruction in science process skills. Journal of Research in Science Teaching, 14(3), 231-234.

Clifford, R. T.; Jorstad, H. and Lange, D. (1977). Student evaluation of peer group microteaching as preparation for student teaching. Modern Language Journal, 61(5-6), 229-236.

Cooper, J. M. et al. (1971). Microteaching: Selected papers. ERIC, ED 055 960

Copeland, W. D. (1977). Some factors related to student teacher classroom performance following micro teaching training. American Educational Research Journal, 14, 147-151.

Copeland, W. D. (1975). The relationship between micro teaching and student teacher classroom performance. Journal of Educational Research, 68(8), 289-293.

Copeland, W. D. and Doyle, W. (1973). Laboratory skill training and student teacher classroom performance. Journal of Experimental Education, 42(1), 16-21.

Crawley, F. and Krockover, G. (1979). Immediate and delayed effects of training preservice secondary science teachers to ask questions of varying cognitive levels. Journal of Research in Science Teaching, 16(3), 243-248.

Davis, O.L. and Smoot, B. R. (1970). Effects on the verbal teaching behaviors of beginning secondary teacher candidates' participation in a program of laboratory teaching: Laboratory observation schedule and record. Educational Leadership, 28(2), 165-169.

DeMarte, P. J. (1974). The effects of micro teaching on the intentions, perceptions, and classroom verbal behaviors of teachers of science:A process approach. ERIC, ED 091 143.

Dreyfus, A. and Cohen, H. (1979). Enhancing student teacher perception of science lessons. Science Education, 63(3), 363-371.

Edwards, C. (1975). Changing teacher behavior through self instruction and supervised micro teaching in a competency based program. The Journal of Educational Research, 68(6), 219-222.

Esquivel, J. et al. (1978). Effect of feedback on questioning of preservice teachers in SCIS microteaching. Science Education, 62(2), 209-214.

Fortune, J. C.; Cooper, J. M. and Allen, D. W. (1967). The Stanford summer micro teaching clinic, 1965. Journal of Teacher Education. 18(4), 389-393.

23

Fuller, F. F. and Manning, B. A. (1973). Self-confrontation reviewed: A conceptualization for video playback in teacher education. Review of Educational Research, 43(4), 469-528.

Gall, M. et al. (1972). Comparison of instructional media in a minicourse on higher cognitive questioning. ERIC, ED 064 326.

Galossi, J. et al. (1974). The use of written versus video tape instruction to train teachers in questioning skills. The Journal of Experimental Education, 43(2), 16-23.

Gardner, M. and Bartholomew, R. (1969). Micro teaching, a medium for modifying teacher behavior. Science Teacher, 36(5), 45-47.

Gregory, I. (1986). Third world-first world: Time for another look at microteaching. Journal of Education for Teaching, 12(2), 173-188.

Guelcher, W. et al. (1970). Microteaching and teacher training: A refined version. ERIC, ED 050 017.

Hargie, W. D. and Dwyer, E. (1982). The reactions of special education teachers in microteaching: A follow-up study. Exceptional Child, 29(1), 53-56.

Hatfield, R. et al. (1989). Designing educational practice: Applying the goal-procedural model to student teaching. Michigan State University, East Lansing, MI.

Hiscox, S. B. and VanMondfrans, A. P. (1972). Feedback conditions and type of teaching skill in microteaching. ERIC, ED 064 249.

Impey, W. (1983). Self-evaluation accuracy: Prerequisite for the professional development of teachers. Paper presented at 1983 ATE Conference.

Johnson, W. D. and Pancrazio, S. B. (1971). The effectiveness of three micro teaching environments in preparing undergraduates for student teaching. ERIC, ED 051 098.

Jones, P. (1979). A survey of micro teaching in secondary teacher education programs of NCATE accredited colleges and universities. ERIC, ED 173 336.

Kallenbach, W. and Gall, M. (1969). Microteaching versus conventional methods in training elementary intern teachers. The Journal of Educational Research, 63(3), 136-141.

Kallenbach. W. and Ward, B. (1974). A pre-service and/or inservice field test of minicourse 15: Developing student independent study skills. ERIC, ED 090 237.

Katz, G. (1976). Use of minicourse instruction with student teachers of educable mentally retarded children. Journal of Educational Research, 69(10), 355-359.

Kleingstedt, F. (1976). Video taped microteaching: Students rate it great. Improving College and University Teaching, 24(1), 20-21.

Koran, J. Jr. (1970). A comparison of the effects of observational learning and self-rating on the acquisition of a questioning behavior by elementary science teacher trainees. Science Education, 54(4), 385-389.

Koran, J. Jr. (1971). A study of the effects of written and film-mediated models on the acquisition of a science teaching skill by pre-service elementary teachers. Journal of Research in Science Teaching, 3, 45-50.

Koran, J. Jr. (1972). The use of modeling, feedback and practice variables to influence science teacher behavior. Science Education, 56(3), 285-291.

Koran, J. Jr. (1974). Training science teachers: Methodological problems and issues in changing behavior. Journal of Research in Science Teaching, 11(3), 205-218.

Koran, J. Jr. (1969). Two paradigms for the training of science teachers using videotape technology and simulated conditions. Journal of Research in Science Teaching, 6(1), 22-28.

Koran, J. Jr. and Koran, M. (1973). Validating a teacher behavior by student performance. ERIC, ED 131 074

Koran, J. Jr. ; Koran, M. and McDonald, F. (1972). Effects of different sources of positive and negative information on observational learning of a teaching skill. Journal of Educational Psychology, 63(5), 405-410.

Legge, W. and Asper. L. (1972). The effect of videotaped micro-teaching lessons on the evaluation of behavior of pre student teachers. Journal of Teacher Education, 23 (3), 363-366.

McDonald, F. and Allen, D. (1967). Training effects of feedback and modeling procedures on teaching performance. ERIC, ED 017 985.

MacLeod, G. (1987). Microteaching: End of a research era? International Journal of Educational Research, 11, 531-541.

McQuerrey, L. (1968). Holding a monitor up to life. Music Educator's Journal, 55(4), 48-53.

Masters, J. and Branch, M. (1969). Comparison of the relative effectiveness of instructions, modeling, and reinforcement procedures for inducing behavior change. Journal of Experimental Psychology, 80(2), 364-368.

Meier, J. (1968). Rationale for and application of microteaching to improve teaching. The Journal of Teacher Education, 19(2), 145-157.

Perrott, E. et al. (1975). Changes in teaching behavior after completing a self-instructional microteaching course. Programmed Learning and Educational Technology, 12(6), 348-362.

Peters, J. (1981). Effects of laboratory teaching experience (microteaching and reflective thinking) in an introductory course on students' views of themselves as teachers and their perceptions of teaching. ERIC, ED 195 713.

Peterson, T. (1973). Microteaching in the preservice education of teachers: Time for a reexamination. The Journal of Educational Research, 67(1), 34-36.

Rice, D. (1977). The effect of question-asking instruction on preservice elementary science teachers. Journal of Research in Science Teaching, 14(4), 353-359.

Riley, J. (1978). Effects of studying a question classification system on the cognitive level of preservice teacher's questions. Science Education, 62(3), 333-338.

Riley, J. (1979). The influence of hands-on science process training on preservice teachers' acquisition of process skills and attitude toward science and science teaching. Journal of Research in Science Teaching, 16(5), 373-384.

Roush, R. (1971). Research using the videotape recorder in teacher education. Education Leadership, 28(8), 849-853.

Santiesteban, A. J. and Koran, J. J. (1977). Acquisition of science teaching skills through pyschological modeling and concomitant student learning. Journal of Research in Science Teaching, 14 (3), 199-107.

Short, M. and Rozum, M. (eds.) (1972). Microteaching: A technique for training teachers to teach elementary children. ERIC, ED 076 548.

Solomon, G. and McDonald, F. (1970). Pretest and posttest reactions to self-viewing one's teaching performance on videotape. Journal of Educational Psychology, 61(4), 280-286.

Sparks, R. and McCallen, E. (1974). Microteaching: Its effect on student attitudes in an elementary science methods course. Science Education, 58(4), 483-487.

Tuckman, B. and Oliver, W. (1968). Effectiveness of feedback to teachers as a function of source. Journal of Educational Psychology, 59(4), 297-301.

Wagner, A. (1973). Changing teacher behavior: A comparison of microteaching and cognitive discrimination training. Journal of educational Psychology, 64(3), 299-305.

Ward, B. et al. (1972). The minicourse in teacher education: A report on minicourse utilization in teacher corps programs.

Ward, B. (1970). A survey of microteaching in NCATE-accredited secondary education programs. ERIC, ED 046 894.

Vukovich, D. and Pfeiffer, I. (1979-80). Self-concept and self-evaluation: What is the relationship? Action in Teacher Education. 2(1), 49-53.

Yeany, R. (1975). Some effects of training preservice teachers in science teaching strategy analysis. ERIC, ED 129 555.

Yeany, R. (1976). The effects of micro-teaching with video taping on the teaching strategies of pre-service secondary science teachers. ERIC, ED 123 105

Yeany, R. (1977). The effects of model viewing with systematic strategy analysis on the science teaching styles of preservice teachers. Journal of Research in Science Teaching, 14(3), 209-222.

Figure 1
The Goal-Procedural Model for Designing
Educational Practice

I. DEFINE AREA OF EDUCATIONAL PRACTICE TO DESIGN OR ANALYZE
(Refer to taxonomy or domains of practice.)

II. DEVELOP A PROCEDURAL MODEL FOR STRUCTURING AN EDUCATIONAL PRACTICE
- A. Review and summarize research studies:
  - -analytical studies
  - -descriptive studies
  - -causal/predictive studies
  - -evaluative studies
- B. Review and summarize descriptions of exemplar practice
- C. Formulate elements of the procedural model
  - -purposes/goals
  - -rationale and conceptual perspective
  - -operational elements

III. DESIGN/ANALYZE AN EDUCATIONAL PRACTICE
- A. Describe context and setting for practice
- B. Plan/describe practice based on procedural model
  - -purposes/goals
  - -rationale and conceptual perspective
  - -operational elements
- C. Formulate assumptions underlying the design or description of practice
  - -Formulate assumptions based on design
  - -compare assumptions with related research, goals, and context
  - -modify design based on negation of assumptions
- D. Test practice as designed/modified.

Figure 2
A Procedural Model for Micro Teaching

A. PURPOSES/GOALS FOR MICRO TEACHING

B. RATIONALE AND CONCEPTUAL BASIS FOR MICRO TEACHING

C. OPERATIONAL ELEMENTS USED FOR CONDUCTING MICRO TEACHING

1. Curricular content
2. Student participants
3. Facilities and setting
4. Skill study
5. Subject matter to teach
6. Planning lessons
7. Feedback